

## ABSTRACT

1 The present invention provides a method and system for distributed residual tomographic  
2 velocity analysis using dense residual depth difference maps. Prestack seismic imaging  
3 is performed using an initial velocity field and interpreted horizons. A residual depth  
4 difference is estimated referenced to fixed offset and all horizons. Residual depth  
5 difference maps are computed for each offset and each horizon. The residual depth  
6 difference maps are back projected to determine slowness perturbation. The initial  
7 velocity model may be converted to slowness and the estimated slowness is composited  
8 therewith to produce a new slowness volume. The new slowness volume is converted to  
9 a new velocity volume for performing prestack seismic imaging. This process is repeated  
10 until the slowness perturbation is negligible or reaches a predetermined threshold.